Life•line

User Reference Manual
Version 2001 for Windows

NOTICES

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WARNING: This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the documentation, the equipment may cause interference with other radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case users, at their own expense, are required to take whatever measures may be necessary to correct the interference.

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FCC RF EXPOSURE INFORMATION

In August 1996 the Federal Communications Commission (FCC) of the United States with its action in Report and Order FCC 96-326 adopted an updated safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC regulated transmitters. Those guidelines are consistent with the safety standard previously set by both U.S. and international standards bodies. The design of this phone complies with the FCC guidelines and these international standards.

Use only the supplied or an approved antenna. Unauthorized antennas, modifications, or attachments could impair call quality, damage the phone, or result in violation of FCC regulations.

Do not use the phone with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. Please contact your local dealer for replacement antenna.

Body-worn Operation

This device was tested for typical body-worn operations using the belt-clip placed 2.0 cm. from the body. To comply with RF exposure requirements, a minimum separation distance of 2.0 cm. must be maintained between the user's body and the belt-clip/holster, including the antenna. The use of other belt-clip/holsters and other non-tested accessories may not comply with FCC RF Exposure requirements and should be avoided.

For more information about RF exposure, please visit the FCC website at www.fcc.gov

Section One: System Concepts

System Description

The Life•line Monitoring System combines a radio telemetry system with a computer to provide continuous monitoring of workers in confined, remote and hazardous locations.

The system consists of two separate operational units: a *monitoring console* and a *personal safety monitor* (PSM). Each entrant carries a PSM that transmits his status as well as that of the work environment via wireless communication to a monitoring console running integrated software, operated by a single attendant.

Audible and visual alarms, as well as voice communication, warn of hazardous conditions.

*Personal
Safety
Monitor
(PSM)*
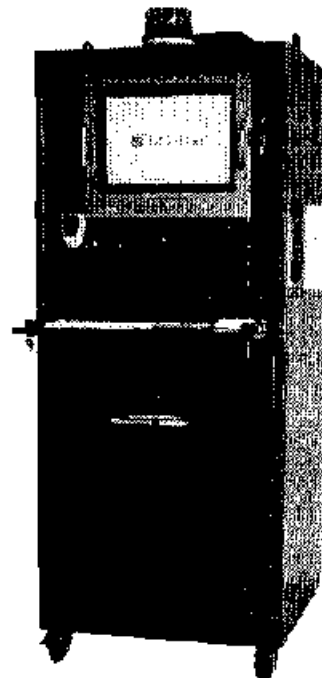
*Main Monitoring
Console (MMC)*
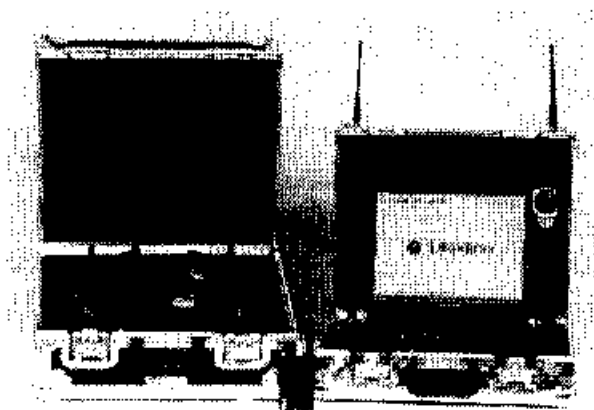
*Portable Monitoring Console
(PMC)*

The attendant operating the monitoring console is responsible for the smooth operation of Life•line; this ensures worker safety and security. The attendant does this by:

- Distributing PSMs and necessary peripherals
- Logging the entrant into the Life•line system
- Monitoring the system for alarms
- Initiating audio communications to entrants when necessary

The PSM is carried by the worker into the confined space. Through the PSM, the worker is able to initiate voice communications, call for help by pressing an alarm, and transmit gas sensor (or other peripheral) readings if such a device has been integrated with the PSM.

Polling Process

Data telemetry—sending data through radio signals—is the basis of communication between the monitoring console and the PSM. A constant stream of data between the monitoring console and the PSM is sent, received, and responded to any time communication is established in the system.

This continuous, dynamic data link provides instantaneous updates and appraisal of the system's operating condition, alarm status, voice requests, and, if so equipped, atmospheric readings.

The following depicts what a data stream might look like if it were visible.

From a monitoring console to a PSM:

PSM #1 >> HERE IS SOME INFORMATION FOR YOU >> DID YOU GET IT ALL?

The PSM's response data stream might resemble this:

PSM #1 >> GOT THE INFO. HERE IS MY DATA.

This exchange of data streams is called a *poll*.

A successful poll occurs when the monitoring console's data stream transmission has been received by a PSM and acknowledged by a PSM data stream response back to the monitoring console. An unsuccessful poll, called a *retry*, will occur if the monitoring console's transmission was not acknowledged by a PSM response.

Since all PSMs communicate with the monitoring console on the same radio frequency, there is risk of garbled data, or data that cannot be attributed to the correct PSM. In order to limit the possibility of data stream confusion, polling a large number of PSMs must be organized.

For this reason, the monitoring console controls its transmission to PSMs in a consecutive acknowledgement manner. The monitoring console will not proceed with its polling cycle until it has determined that a response was received from the PSM with which it is currently communicating. If there is no response, the monitoring console will attempt one more communication; it will then continue polling the other PSMs.

The monitoring console will transmit to each PSM, one at a time, in the order of the ID number assigned to each PSM.

For example, if two PSMs are logged into the system, they will be polled individually and sequentially, as illustrated in the following algorithm:

Poll Cycle No.	Action No.	Action
1	1	Transmit to PSM #1
1	2	Wait for response from PSM #1 **or** determine that a retry has occurred
1	3	Transmit to PSM #2
1	4	Wait for response from PSM #2 **or** determine that a retry has occurred
2	1	Transmit to PSM #1
2	2	Wait for response from PSM #1 **or** determine that a retry has occurred
2	3	Transmit to PSM #2
2	4	Wait for response from PSM #2 **or** determine that a retry has occurred...

The completed polling of all PSMs is called a poll cycle. Once a poll cycle is completed, there is a 10-second pause, after which the next cycle begins.

PSM Query

A key component of the Life•line system is the PSM *query*. This feature satisfies government regulations regarding entrant monitoring in that the PSM will periodically query the entrant through a series of unique beeps. These beeps replace the action of one worker yelling into the workspace, or banging on the surface, effectively asking another worker, "Are you OK in there?"

It is the entrant's responsibility to respond to the beeps by pressing the *query button* on the PSM. This silences the beeps and, in effect, sends the response, "Yeah, I'm fine!" If the query button is not pressed, the PSM

will inform the monitoring console through its transmitted data stream. The monitoring console will then generate an alarm.

The frequency of queries (in minutes) is unique to each location, and is pre-configured by Safe Environment Engineering to meet the user's needs. The amount of time allotted for the entrant to respond to a query is also pre-configured in this way.

Host-to-Satellite Communication

This section applies only to those Life•line systems configured with satellite monitoring consoles (satellite system).

In a satellite system, one console will act as the master console (*host*) and the remaining consoles act as slaves (*satellites*). Much like the way the monitoring console controls the PSM poll cycle, the host console will control the radio transmissions from the satellites to ensure that there are no transmission collisions. The host "tells" the satellites when it is their turn to transmit, as well as dictates the contents of their transmissions.

Data Streams

As when communicating with a PSM, the host console transmits data streams to the satellite console and awaits a responding data stream. The nature of the content of these data streams is more instructional than informational.

A satellite may act as one, or both, of the following:

Remote Logon Station. This enables operators to log into the system at a location other than the host.

Repeating Transmitter/Receiver (repeater). This configuration is used to enhance signal coverage in an area where conditions would otherwise hamper communication with the host.

Activities initiated at a satellite console are actually requests made of the host. The request is transmitted to the host console which, in turn, responds to the satellite by completing the request, or giving instructions to the requesting satellite or to another satellite.

Surrogate-Node Relationships

Instructions transmitted between monitoring consoles enables an entrant to log on a PSM at one monitoring console yet be in communication with the telemetry radio at another monitoring console. This type of logon establishes a "surrogate-node" relationship.

The surrogate is the console at which the physical logon instruction was initiated by the attendant; the node is the console at which the telemetry

radio will be used to communicate with the PSM (either directly or as a repeater station).

A surrogate-node relationship *does not exist* when the physical logon and communications occur at the same monitoring console.

Examples of Surrogate-Node Relationships:

(All examples assume a system consisting of a host monitoring console and two satellite consoles.)

Logon instruction given at satellite #1, PSM polled through satellite #2	Satellite #1 is the surrogate, Satellite #2 is the node.
Logon instruction given at host console, PSM polled through satellite #1	Host is the surrogate, Satellite #1 is the node
Logon instruction given at satellite #2, PSM polled directly by host console	Satellite #2 is the surrogate, Host console is the node

Network Communication

Networked systems have at least one server and one or more "polling" consoles. In addition, a network may have one or more master consoles (the server may also be a master).

The server controls all connections within the network and coordinates all network messaging

A master console, if present, monitors all activities within the network.

The "polling" consoles perform the function of polling the PSMs.

Networked System Features

Networked systems provide three important features:

Vastly increased number of PSMs connected. A single console can poll only 100 PSMs maximum. Networked systems can support multiples of this number.

Monitoring and control of all network consoles can be done from any network console. This makes the system even more flexible.

"Fail-safe" operation. This means that if any system component fails, including the server, the remainder of the system continues operating normally.

Section Two: System Components

The Personal Safety Monitor (PSM)

The Personal Safety Monitor (PSM) continuously communicates the status of the employee and the work environment to the main monitoring console (MMC), and/or satellite console utilizing technology similar to that of a packet radio—a radio frequency modem.

Intrinsically Safe Certification

The PSM is certified *Intrinsically Safe* for use in the following hazardous locations:

- Class I, Division 1: Groups C and D
- Class II and III, Division 2: Groups E, F, G

Water Resistancy

The PSM is housed in an impact and water-resistant case designed to protect the unit in the roughest industrial environments.

> **NOTE:** Although the PSM is rated as water-resistant, it is not waterproof. Total immersion in liquid will damage the PSM.

Battery Installation and Removal

> **WARNING:** To avoid possible injury, do not *remove* or *install the battery* while the PSM is in a hazardous area.

Bump Latch   Remove   Install
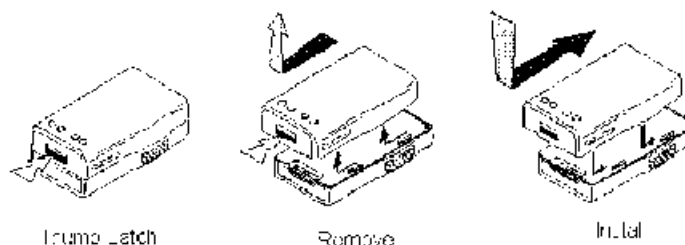
Removing and Installing Battery

Installing the Battery

1. Hold the PSM with the back of the unit facing up.

2. Place the battery against the back of the PSM so that the tabs on the PSM engage the four openings in the battery.

3. Slide the battery toward the top of the PSM until the latch "clicks" firmly into the recess at the bottom of the PSM.

Removing the Battery

1. Hold the PSM with the back of the unit facing up.

2. With the thumb of your other hand on the battery's finger grooves, slide the latch at the bottom of the battery toward the back of the battery.

3. While holding the latch up, slide the battery down toward the bottom of the radio.

Controls and Indicators

LOW BATTERY/ STATUS CHECK Illuminates when PSM receives Low Battery notification. Illuminates upon turn on to verify status OK.

OPTIONS PORT Right side - connects external devices.

SPEAKER Provides voice and/or tone information

ALARM BUTTON Triggers alarm condition at the MMC.

MICROPHONE Transmits voice to MMC Attendant.

ALARM INDICATOR Super bright LED flashes with Morse Code S.O.S. tones.

QUERY/LUNCH Green button/indicator. Push to respond to query. Flashes in sequence to query tone. Lunch - hold for 3 seconds.

VOICE Press and hold to talk - release to listen. Establishes voice contact with MMC and/or Satellite. Audible indication of PSM entering and exiting voice mode.

Controls and Indicators

Provided on PSM upgrades with the Immediate Alarming feature.

Options Port

The PSM can be modified to meet customer requirements through the use of external interfaces. These interfaces are attached to the options port receptacle located on the right side of the PSM. Insert the interface device connector at the options port as shown (see illustration below).

WARNING: To avoid possible injury: do not *remove* or *install* optional devices while the PSM is in a hazardous area.
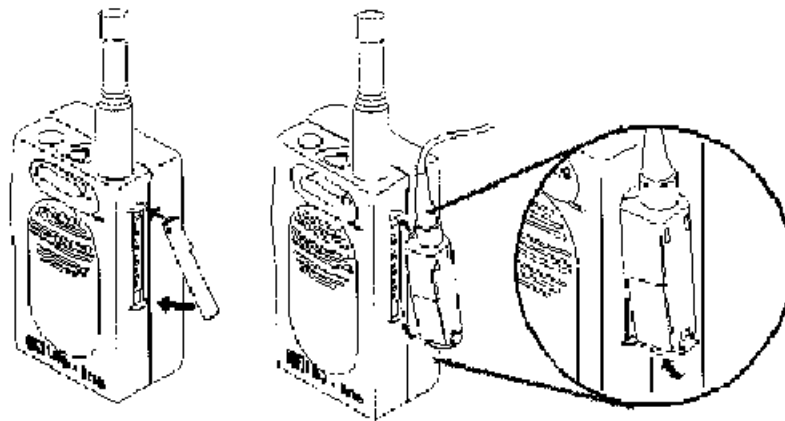
Options Port: Gas Sensor Plug-In

Options Port>Gas Sensor

To integrate a gas detection system with the Life•line system, plug the sensor device into the Options Port of the PSM (see previous illustration).

A gas sensor provides real-time information on measurables such as current concentration levels, time-weighted averages (TWA), and short term exposure limits (STEL) of gas levels in the environment. These levels are transmitted to a database contained in the MMC to track information such as the exposure limits of the operators or locations over time. The data is displayed on the system computer screen in the form of reporting grids and printable reports. {x ref: reports}

A gas sensor will also interface with the PSM alarm if the environment becomes contaminated or deprived of oxygen. If the gas detection system goes into alarm, the PSM will produce an audible and visual alarm signal.

Options Port>Speaker Microphone

In noisy environments and in environments where respirators are required, a combination speaker/microphone headset or handset may be connected to the PSM at the options port. This extension of the PSM's audio features allows for greater versatility in a variety of work locations.

PSM Operation Overview

> **CAUTION:** Persons who are to use a Life•line Personal System Monitor should be formally trained on the PSM features, functions, proper use, and should be knowledgeable of the End User's Monitoring Program Policies and Procedures.

In conjunction with the interactive MMC/PSM polling process, each PSM operator must physically respond to a system query at pre-determined intervals by pressing the QUERY button. Doing this informs the MMC or satellite attendant that everything is all right.

Failure to acknowledge the status query within a preset period of time triggers an alarm warning tone and a flashing red LED on the user's PSM. The warning tone and flashing LED will last for approximately one minute to give the user sufficient notice of a pending alarm condition. Subsequent failure to respond will automatically put the PSM into an alarm state and simultaneously cause an alarm condition at the MMC and/or satellite.

PSM operators may request voice communication or an alarm condition at any time by pressing the appropriate button on the PSM. The MMC or satellite attendant can respond to any operator signal by voice.

System Response to an Alarm

When any PSM operator initiates an alarm, the computer screen at the MMC or supporting satellite displays the operator's name, work location, and other pertinent information. Both a system alarm horn and strobe light will alert the monitoring system attendant.

If an operator is incapacitated in any alarm condition, the system attendant at the MMC can remotely activate the PSM microphone and listen in. No action is required by the operator.

Following any alarm condition where multiple operators are evacuated from a common work location, the Life•line Monitoring System

continues its polling cycle to ensure the safety of all workers after the evacuation. In other words, the system will take attendance.

Pre-Log On Checklist

1. Check the PSMs in the battery charger.

Choose a PSM from a charger that has a green light; this indicates the battery is fully charged.

2. Remove the PSM from the Charger.

PSM will automatically turn on.

3. Check the alarm indicators.

The indicators should flash 1 to 22 times, indicating that the PSM is functional and that it has successfully performed all of its initial self-tests.

Battery Charger

If the PSM alarm indicators do not light up, or the Low Battery "chirp" is heard, the unit should IMMEDIATELY be returned to the supervisor for replacement.

4. Log On.

Operators must log on within five minutes at their designated MMC.
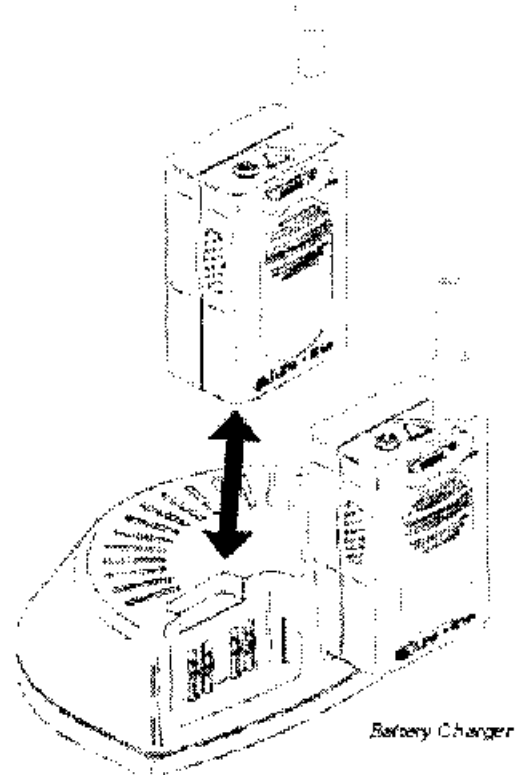
Logging On

Before an operator enters a controlled work area, he must log on to the system at the designated MMC, either with the assistance of the MMC attendant, or by himself if authorized to do so.

Logging on enters the operator into Life•line Monitoring System's computer by name, location, and optional chemical/gas sensor in use.

The periodic query between poll cycles verifies each operator's status throughout the work period.

In case of emergency, the name, location, job description, and supervisor name are immediately displayed on the system's computer screen and available for hard copy print-out at the MMC. Emergency instructions pertaining to a specific operator are instantly available as well.

Alarms and Responses

Once a PSM is in alarm, it may only be reset by the MMC attendant. The MMC and the affected PSM both signal any alarm to the MMC attendant and the PSM operator.

Unless instructed otherwise, any time a PSM is in alarm, operators *must:*

- Evacuate the work area.
- Go to the pre-designated safe location.
- Contact the MMC attendant immediately.

The following table lists the alarms, the function of each alarm, and instructions for responding to each alarm.

ALARM	FUNCTION	OPERATOR RESPONSE
Query	PSM OPERATOR MAY BE IN TROUBLE Operator fails to respond to status query and pre-alarm	Press VOICE button and verbally notify MMC attendant of the reason for not responding to the query
Help	NEED HELP Signal from PSM that the operator needs help	
Retry/ poll	MMC HAS LOST CONTACT WITH PSM PSM is not in the area protected by the MMC.	Return to a known monitored location
Low battery	"Chirping" sound from PSM in conjunction with blinking Low Battery LED.	Evacuate area immediately Go to a safe location Report to MMC attendant via voice/data button

ALARM	FUNCTION	OPERATOR RESPONSE
Optional	WARNING Optional equipment (gas sensor/ environmental monitoring device) detects a hazardous condition.	Evacuate area immediately Go to a safe location Report to MMC attendant via voice/data button
Built-in safety test	WARNING PSM requires maintenance.	Immediately exchange the PSM
Global	WARNING Deliberately sent by MMC attendant to all PSMs.	Calmly leave the current location and return to the log-in console
Evacuation	WARNING Deliberately sent by the MMC attendant to all PSMs.	Calmly leave the current location and report to pre-designated evacuation location

Audible / Visual Indicators

The PSM is equipped with both audible and visual signals to inform operators of every mode of operation.

Users *must* memorize these signals and their meanings.

The following table lists the Morse Code signaling used by the PSM:

MESSAGE	ALPHANUMERIC EQUIVALENT	MORSE CODE SIGNAL
Alarm/Help	S.O.S.	• • • – – – • • •
Query	0	– – – – – –
Pre-Alarm	S	• • • • •
Into Voice	I	• •
Exit Voice	E	•
Evacuate	DDD	– • • – • • – • •
Lunch	M	– –

When the PSM receives a signal, the speaker produces a series of short and long ("dot" and "dash") audible signals that correspond to the Morse Code patterns listed above.

Along with the audible signaling, LEDs located on the top and front cover of the unit will flash in unison with the Morse Code patterns.

Voice Communication

Voice communication can be initiated by either the MMC attendant or PSM operator.

1. Press and release the VOICE button on the left side of PSM to request voice mode.

2. Listen for the indication that the PSM has entered the voice mode (two beeps).

3. Press and *hold* the VOICE button for one second. Speak into the microphone.

4. Release the VOICE button to listen.

5. After approximately 15 seconds, the PSM will return to the data/monitor mode.

6. Listen for the indication that the unit has exited the voice mode (one beep).

7. If more time is necessary, repeat steps 1 through 6.

Main Monitoring Console (MMC)

STROBE Flashes red in response to alarm conditions

HEAT EXCHANGER MMC cooling system

ON/OFF Keylock switch controls power for MMC

VOICE CONTROLLER Enables voice communication between MMC Attendant and PSM Users and/or Satellites.

MONITOR Displays menus and messages - controlled by the MMC Attendant

KEYBOARD/TRACKBALL

ELECTRONIC MAP and LOG-IN SHEET

PRINTER Prints hardcopy data, reports, or monitor displays as needed.

COMPUTER Controls the Lifeline system.

Main Monitoring Console

Portable Monitoring Console (PMC)
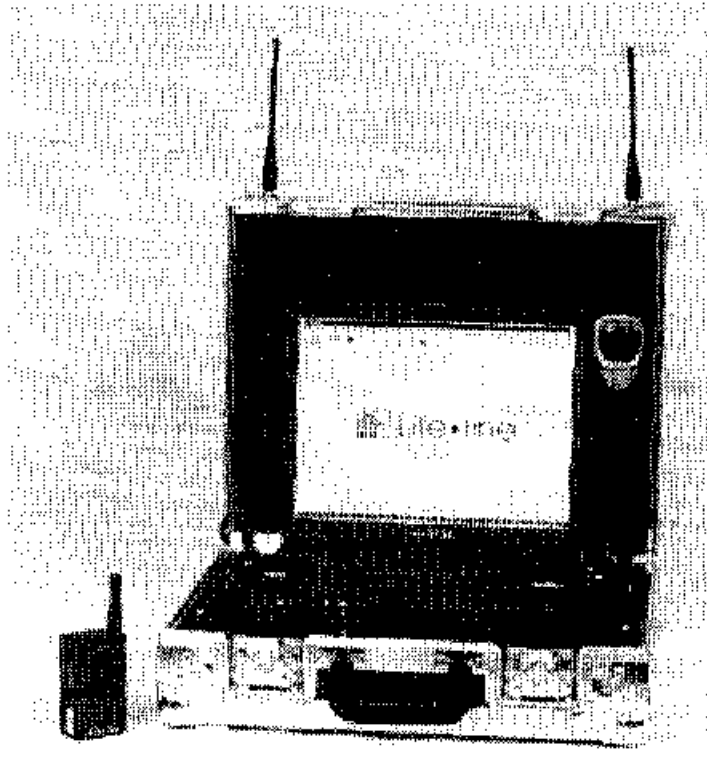
Portable Monitoring Console

The Portable Monitoring Console (PMC) is essentially the same as the MMC. Other than size, the only difference between the PMC and the MMC is that the uninterruptible power supply (UPS) is replaced by an AC/DC interface. This interface allows the PMC to operate on a 12-volt DC source (such as the cigarette lighter in a car) or a 120-volt AC electrical outlet.

Remote Log-on Terminal (RLT)

- Strobe light
- Light pen
- Computer monitor
- Keyboard
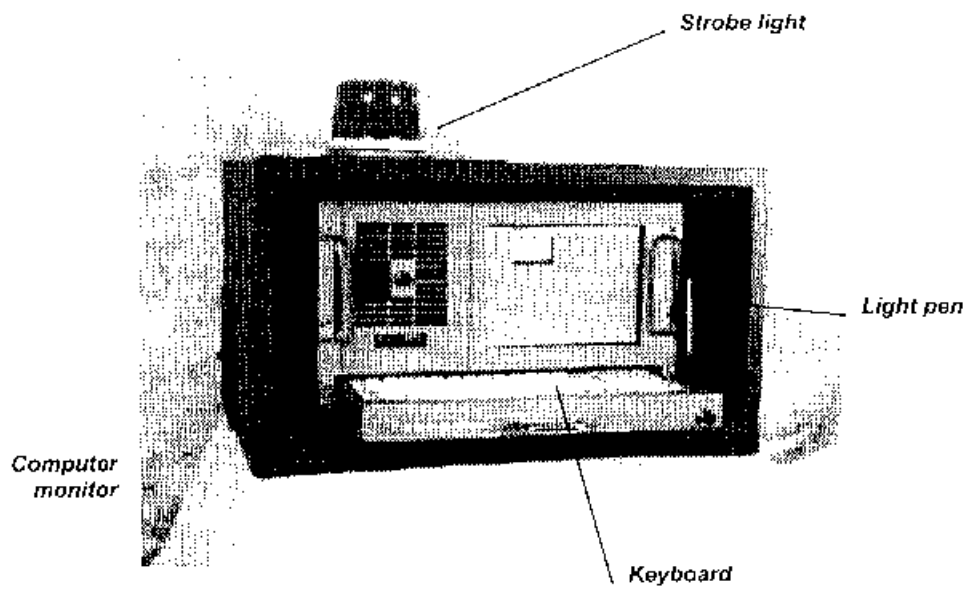
Battery Charger Cart
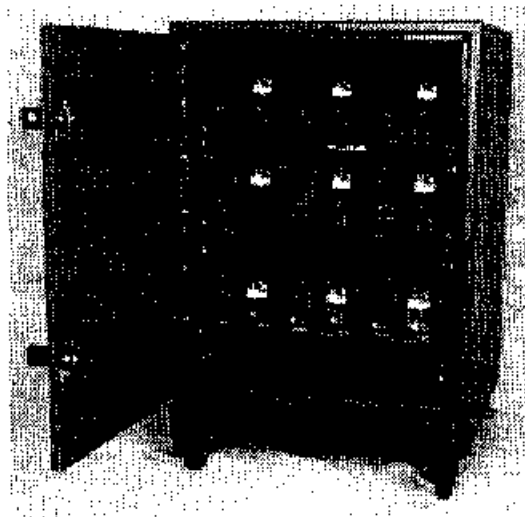
Battery Charger Panel
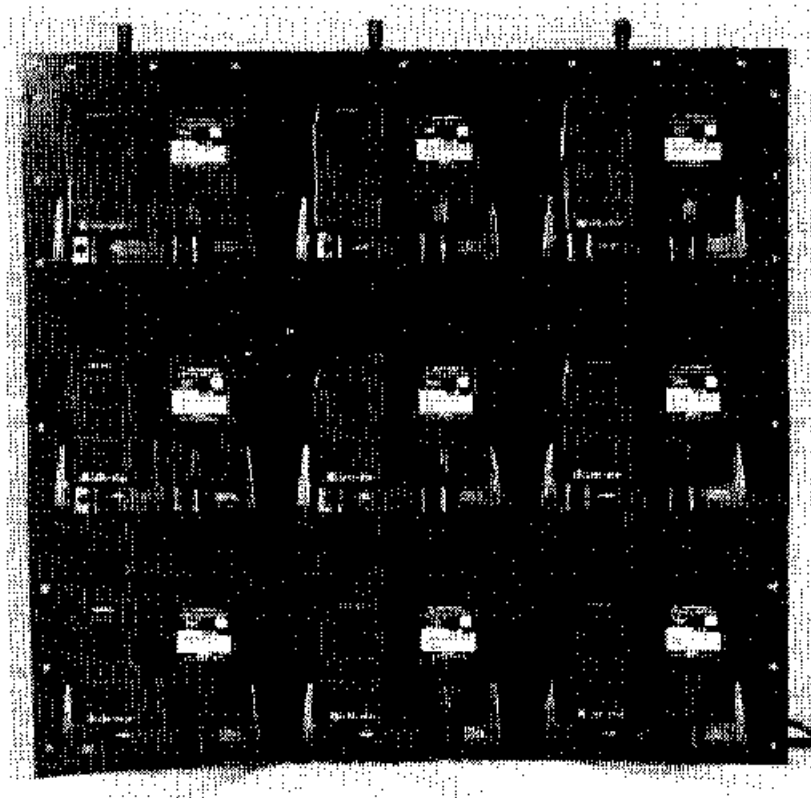
Section Three: The Software Interface

Accessing Screens

You can access the Life•line system options from either the pull-down menus across the top of the screen, or by using the speed buttons immediately below the pull-down menus.
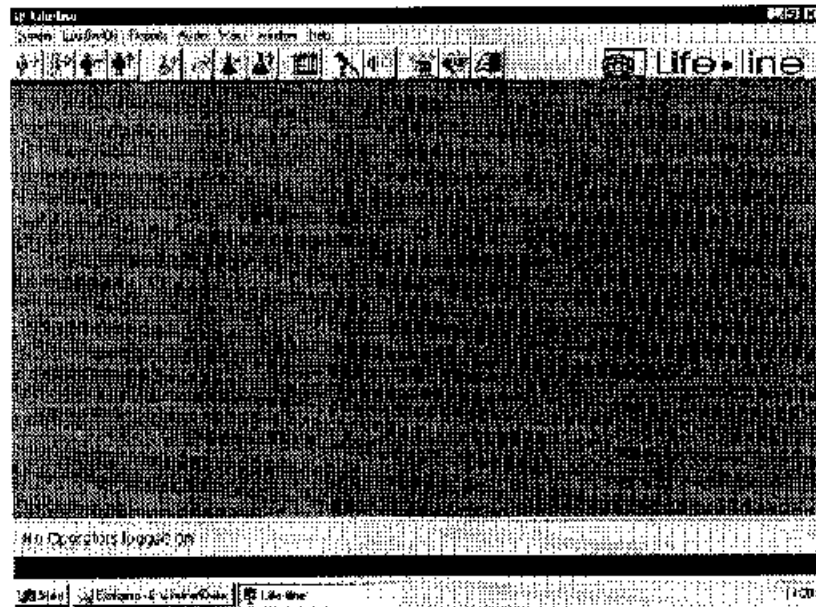
Life•line opening screen

Speed Buttons
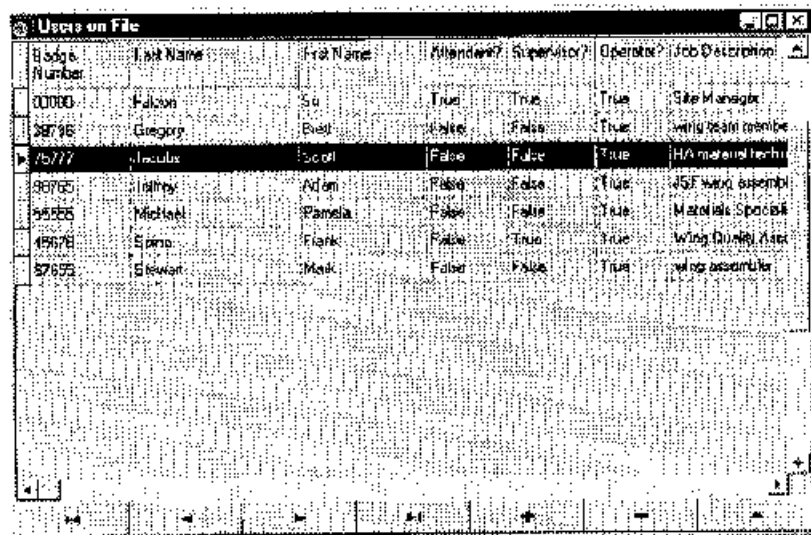
Speed buttons allow you to jump immediately to the associated data entry screen or report grid. Only the most frequently accessed or critical screens have speed buttons.

Speed buttons displayed may vary based on your system's configuration.

The speed buttons and the screens they access are:

Log On Operator screen (disabled if the Log On / Off box is checked in the Consoles File).

Move Operator screen (disabled if the Log On / Off box is checked in the Consoles File).

Shortcut to Log Off Operator screen (disabled if the Log On / Off box is checked in the Consoles File).

Who's Logged On? report grid.

Add Materials screen (disabled if the Log On / Off box is checked in the Consoles File, or if Materials have not been checked on the Configuration tab page of the System Setup).

Operator-to-Operator Materials Transfer screen (disabled if the Log On / Off box is checked in the Consoles File, or if Materials have not been checked on the Configuration tab page of the System Setup).

Operator Materials Transfer Out of Location screen (disabled if the Log On / Off box is checked in the Consoles File, or if Materials have not been checked on the Configuration tab page of the System Setup).

Materials in Use report grid (disabled if Materials have not been checked on the Configuration tab page of the System Setup).

Current Sensor Monitor Current Readings report grid (disabled if Sensors have not been checked on the Configuration tab page of the System Setup).

Talk Selection screen, which allows an attendant to select specific operators, all operators, locations, or consoles (networked systems only) for two-way communication.

Listen to Operator screen, which allows an attendant to listen to operator voice transmissions or environmental sounds coming from the vicinity of the operator.

Warn Selection screen, which allows an attendant to select a specific operator, all operators, locations, or consoles (networked systems only) for alarm warning.

Warn All (Global) screen, which allows an attendant to warn all operators, or to issue an optional evacuation alarm.

Evacuate screen, which allows an attendant to issue an evacuation alarm to all operators.

Navigating Data Grids

Typical data grid

Data grids are used throughout Life•line to present information in a summary format. A grid is navigated by mouse, by cursor keys, or by navigation bars located at the bottom of the data grid.

Navigation Bars

There are two types of navigation bars:

- Those that facilitate data entry (Data Entry/Navigation Bar)
- Those that are strictly used for moving around inside a grid (Navigate Only Bar)

Navigation Bars>Navigate Only Bar

Grids that are used for reporting purposes and do not allow data input have a Navigate Only bar on the bottom of the screen that facilitates vertical movement through the data stack.

The Move-Only Navigation Bar

The arrows on either end of the bar move the blue highlighting wand to the beginning or end of the stack. The two inside arrows move the

highlighting wand forward or backward through the stack one selection at a time.

Navigation Bars>Data Entry Navigation Bar

Grids that accept data entry changes, additions, and deletions have a Data Entry/Navigation bar at the bottom of the screen that facilitates data input by linking to a "file screen" (Life•line's data entry/edit facility for system setup). (See Entering and Editing Data, Page 3-6)

The Data Entry Navigation Bar

The data entry navigation bar uses the same forward/backward buttons as the navigate-only bar, plus three others:
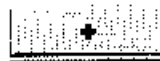
 Opens a blank file screen for creation of a new record. (See illustration below)

A blank file screen, ready for data
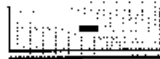
Deletes the selected record. You will be asked to confirm that you wish to delete the current record. (See illustration below)
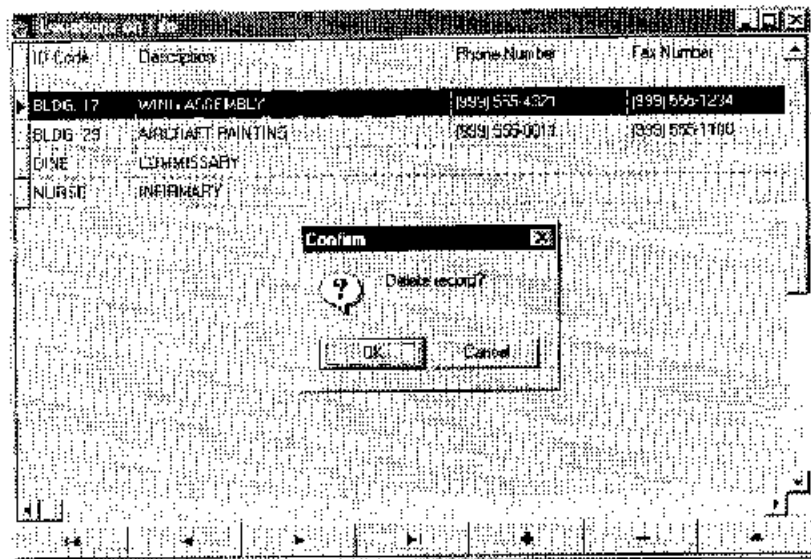
Delete Record confirmation box
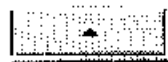
Takes you to the file screen of the selected record. (See illustration below)

A typical file screen (data entry/edit facility) resulting from clicking a Jump to File Screen button

Entering and Editing Data

Data is entered in two types of screens:

- File Screens
- Transaction screens

File Screens

File screens are accessed via the menu selections located under the System Menu. These are the screens used to configure the Life•line system, its equipment, and its operators. This data is generally free-form in nature (i.e.. the user decides how a particular piece of equipment will be numbered, coded, or described; or how badge numbers will be assigned to individuals).

Blank File Screen, ready for data entry

Access tab pages by clicking on the top of the tab.

Indicate confirmation in check boxes by clicking inside the box.

Click on the up/down arrow buttons to change the default value in a field. Value increments are increased/decreased by amounts pre-configured by Safe Environment Engineering.

Fill in date fields one of two ways:

- Manual entry
- Calendar screen entry

(See File screens>Date fields>Manual Entry and File screens>Date Fields>Calendar Screen Entry, page 3-8)

Okay — Inputs data into the Life•line system.

Reset — Returns the screen to its former state, before any changes were made.
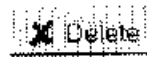
Delete — Deletes the current record.

Exit — Closes the screen, without any changes being entered or saved.

If you click on the Delete button, you will be asked to confirm that you wish to delete the current record.
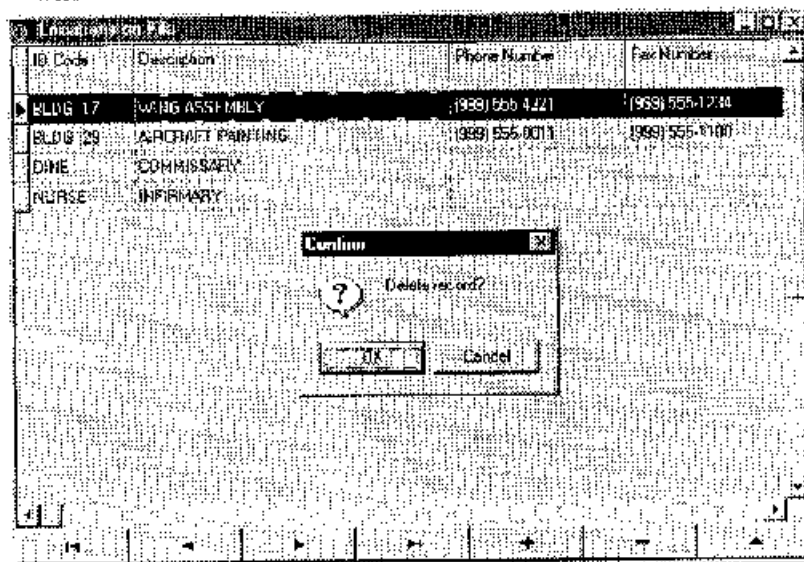
Delete Record confirmation box

File screens>Date fields>Manual Entry

Type the month, day, and year, separated by commas, periods, or slashes (hyphens are not accepted). Single digits are acceptable. For example, 1/1/1 will yield 1/1/2001, and 1,2,3 will yield 1/2/2003.

File screens>Date Fields>Calendar Screen Entry

Click on the calendar button to the right of a date field to bring up a pop-up calendar screen.
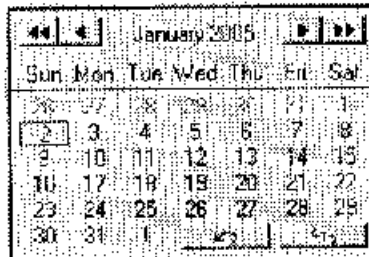
Pop-up calendar screen

The outside double arrows at the top of the calendar screen increase/decrease the date by year increments. The inner single arrows increase/decrease the date by month. Select the day by clicking on it.

The left button at the bottom resets any changes you've made to the date field. The right button inserts today's date into the field.

The directional arrows on the keyboard are also useful for moving between days, months, and years. Whatever date the cursor stops on is automatically inserted into the date field.

Operation Screens

An operation screen results in an action taking place within the Life•line system (i.e., logging operators and materials on and off, generating reports, issuing alarms).

Operation Screens contain blank fields requiring selection of appropriate data that has been previously configured in the file screens.

Data can be entered into blank fields in four ways:

- By typing
- By right clicking into the blank field
- By pressing the F2 key
- By using the light pen

Operation Screens>Data Entry>Typing

Data must be typed in exactly as it has been entered in the file screens.

Operation Screens>Data Entry>Right Clicking

Right click into the blank field to bring up a data grid containing choices that are acceptable for the field.

Navigate to the data you wish to select by using any of the methods covered under Navigating Data Grids on page 3-3.

Double click on the highlighted selection, or press enter. The data is automatically entered into the field.

Operation Screens>Data Entry>F2 Key

Press the F2 key to bring up a data grid containing choices that are acceptable for the field.

Navigate to the data you wish to select by using any of the methods covered under Navigating Data Grids, page 3-3.

Double click on the highlighted selection, or press enter. The data is automatically entered into the field.

Operation Screens>Data Entry>Light Pen

Click in the field for which you wish to enter data. Swipe the light pen across the bar code located on the equipment or employee badge number being logged onto the system. The data is automatically entered into the field.

Operation Screens>Buttons

Operation Screens have two buttons at the bottom:

 Inputs selected data into the Life•line system and begins an operation.

 Cancels the operation without entering any data into the Life•line system.

Any screen with a cancel button can also be nullified by pressing the Escape key.

Printing Reports

Several of the Life•line reports available are capable of being printed.

Two print buttons are found in the Life•line system, which do the following:
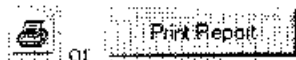
 Sends the report to the printer, or prints the report to file.

Section Four: **Attendant Software**
System

Full System Configuration

Navigating to the System Setup menu

The Life•line system must be fully configured for the environment in which it is to be used.

Some configuration steps, such as System Setup, Consoles, and Sensor Profiles are completed by Safe Environment Engineering on behalf of the user when the system is first installed.

Other configuration options must be maintained on an as-needed basis when hardware, users, and other factors change.

System>System Setup

System Setup controls the overall operation and accessibility of the entire Life•line system.

Access to System Setup options is granted only to individuals possessing the system password (e.g., Safe Environment Engineering field technicians).

System Access: Password dialog box

Once a password is accepted, four tabbed pages become accessible:

- Configuration
- Security
- Licensee
- Support Information.

System>System Setup>Configuration

Configuration identifies the monitoring console, its network connections, how it is equipped and the parameters controlling the way it polls personal safety monitors.

System Configuration tab page

FIELD	DESCRIPTION
Console ID	A unique identifier associated with this monitoring console. This is a free-form entry, four to ten alphanumeric characters long. It is established in the Consoles File. (See Configuring the Consoles, page 4-11)
Network Server Drive	The computer drive letter assigned for shared network use when multiple consoles are connected via a Local or Wide Area Network (LAN or WAN).
	If this monitoring console is not part of a network, select the drive letter identifying the partition containing the Life•line system.

FIELD	DESCRIPTION
Max PSM ID	The highest ID number that will be assigned to a PSM for a particular console. This eliminates lag time between polling cycles by confining the console's search for available PSMs to query or from which to expect to receive data.
New PSM?	If checked, signifies that the system supports the Caller ID feature, and that the PSMs require a three-digit ID number.
Materials?	If checked, signifies that the monitoring console is being used to track materials, hazardous or otherwise. Any menu options, report screens, or speed buttons associated with Materials will be enabled.
Sensors?	If checked, signifies that the monitoring console is equipped with gas sensors designed to interface with the PSMs and used to track operators working in hazardous environments. Any menu options, report screens, or speed buttons associated with Sensors will be enabled.
	Once sensor profiles and sensor data have been entered into the Life•line system, sensors can be logged on with PSMs and PSM operators, and their gas readings will be monitored by the system. (See Configuring the Sensors File, page 4-41)
Operator Badge Number Mask Code	A PSM gas configuration parameter supplied by Safe Environment Engineering.
Equipment Service Threshold	The maximum number of hours that a piece of equipment may be in service before maintenance becomes mandatory. If the Service Threshold has been reached on an equipment item, a service report is automatically printed, and can be sent with the piece of equipment to the maintenance provider
	The system will suspend the use of the equipment by preventing it from being logged in to the system, until the equipment has been properly maintained and returned to service. (See System>Equipment Service>Service Records on File grid>Equipment Service File, page 4-45, and Reports>Service Logs, page 4-84)
Certificate Training/ Expiration Warning Days	Defines the number of days in advance that the system will warn an Attendant that a particular PSM operator's training certification will expire.
Default Times: Query	Number of minutes between system polls of the PSMs.

FIELD	DESCRIPTION
Default Times: **Alarm**	Number of minutes after a pre-alarm condition occurs, before the system will transmit an SOS alarm to PSM operators.
Default Times: **Lunch**	Number of minutes initially allotted for meal breaks when a new location is set up. Meal breaks can also be set in the Locations File, and will override this default time if different. (See Locations>Locations on File grid>Locations File screen, page 4-21)
Default Times: **Break**	Number of minutes initially allotted for rest periods when a new location is set up. Breaks can also be set in the Locations File, and will override this default time if different. (See Locations>Locations on File grid>Locations File screen, page 4-21)
Poll Timing: **MMC: Connect**	Number of milliseconds the MMC keeps the telemetry radio activated in transmit mode prior to actual data transmission. This allows the MMC to establish a reliable connection.
Poll Timing: **MMC: Transmit/Receive**	"Transmit" specifies the number of milliseconds the MMC utilizes for actual data transmission to the PSM. "Receive" specifies the number of milliseconds the MMC waits for a response from the PSM, after the MMC transmits its data and switches the telemetry radio into Receive mode.
Poll Timing: **PSM: Wakeup**	Number of milliseconds that PSMs will "wake up" prior to their appointed poll time (within the overall polling cycle). This allows the PSM circuitry enough time to properly energize. The PSM's internal timing is counted in five-millisecond intervals; any value not divisible by five will be rounded.
Poll Timing (in **Milliseconds):** **PSM: Transmit**	Number of milliseconds that PSMs will remain active in transmit mode in order to establish a reliable connection for data transmission back to the MMC. The PSM's internal timing is counted in five-millisecond intervals; any value not divisible by five will be rounded.

FIELD	DESCRIPTION
Minimum Complete Poll Cycle (All PSMs)	The minimum time, in milliseconds, the MMC should utilize to poll all active PSMs before beginning the next round of polling.
	A minimum value, typically ten seconds (expressed as 10,000 milliseconds), ensures that PSMs will not be polled more than once in that specified time frame. If environmental conditions dictate, the value can be set as low as 1 for continuous monitoring, or to 60,000 for minute-by-minute monitoring. Values can, of course, be higher.
Minimum Consecutive Retries for Alarm	The number of consecutive failed polls (i.e., missed radio connections) the system should allow with an individual PSM before reporting a "retry" alarm. This value is typically divisible by two, given that failed polls generate an immediate retry attempt, causing the "retry count" to rise as a factor of two.

System>System Setup>Security

Depending on the client user's future needs, Safe Environment Engineering may establish password protection on any or all of the fields in the Security tab page.

If a password has been previously established in a field, a prompt will request the matching password in order to gain access to that function and make any changes.

If no password has been established, then no password will be requested, and changes to the function can be made.
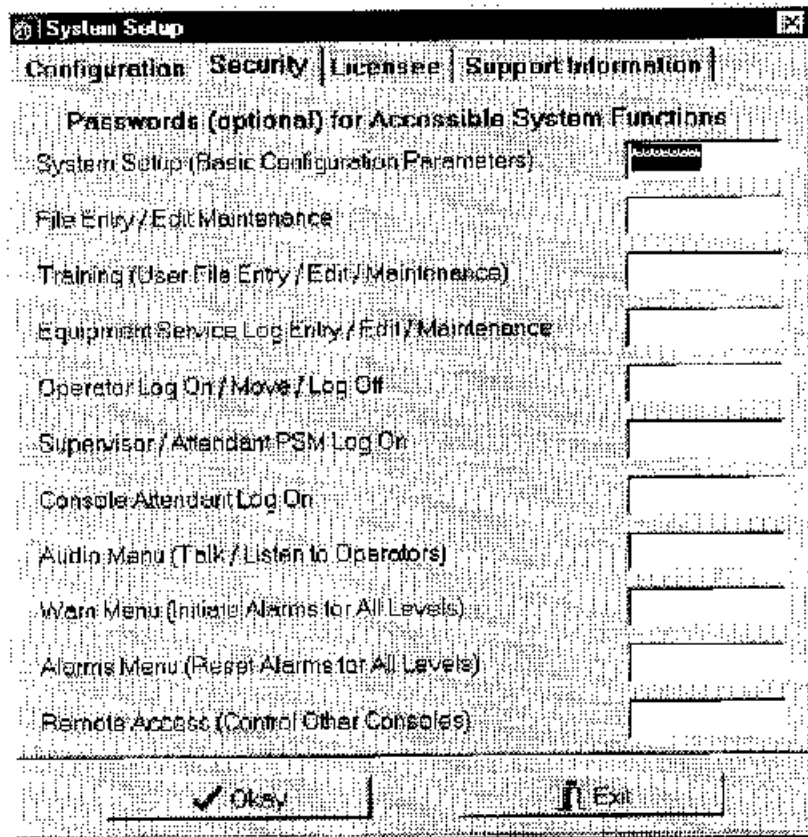
System Security tab page

FIELD	DESCRIPTION
System Setup (Basic Configuration Parameters)	Grants access to make adjustments to any of the system configuration parameters. (See System>System Setup, page 4-1).
File Entry/Edit Maintenance	Grants access to the following pull-down menus: Consoles, Materials, Locations, Sensor Profiles, Sensors, Equipment Service, and Transfer Times (networked systems only).
Training (User File Entry/Edit Maintenance)	Grants access to the Users pull-down menu. (See Configuring the Users, page 4-25)
Equipment Service Log Entry/Edit Maintenance	Grants access to Equipment Service Logs for data entry and editing. (See Configuring Equipment Service Logs, page 4-44)
Operator Log On/Move/ Log Off	Grants access to the Log On Operator, Move Operator, and Log Off Operator data entry screens. (See Logging On/Logging Off, page 4-51)

FIELD	DESCRIPTION
Supervisor/Attendant PSM Log On	Grants access to the Supervisor/Attendant PSM Log On screen. (See Log On/Off>New Attendant, page 4-58)
Console Attendant Log On	Grants access to the Console Attendant Log On screen. See Log On/Off>New Attendant, page 4-58)
Audio Menu (Talk/Listen to Operators)	Grants access to all functions under the Audio Menu. (See Establishing Two Way Audio Connections, page 4-88)
Warn Menu (Initiate Alarms for All Levels)	Grants access to all functions under the Warn Menu. (See Issuing Warnings, page 4-94)
Alarms Menu (Reset Alarms for All Levels)	Grants access to all functions under the Alarm Menu. (See Checking Alarm Status, page 4-103)
Remote Access (Control Other Consoles)	Grants privilege of making system entries or edits at another console without having to enter a password.

System>System Setup> Licensee

This tab page contains data entered by Safe Environment Engineering on behalf of the user.

System Licensee tab page

System>System Setup>Support Information

Depending on arrangements made between the user and Safe Environment Engineering (SEE), this tab page contains contact information for SEE headquarters, SEE affiliate, or the SEE field technician assigned to the user.

Support Information tab page

Configuring the Consoles

Navigating to the Consoles menu

The Consoles menu selection allows the Attendant to review, maintain, and, if authorized, enter and edit information concerning the monitoring console(s).

Two screen levels compose the data entry/edit facility:

- Consoles on File grid
- Consoles File screen

System>Consoles>Consoles on File grid

The Consoles on File grid is presented upon menu pull-down. Much of the monitoring console(s) information presented here is summarized data that has been entered via the Consoles File (see below). If multiple console entries are found, a networked configuration exists.

The Consoles are displayed in alphabetical order, based on Console ID. The grid must be scrolled left or right to present all available data.

Consoles on File grid

The grid also contains console-specific data (Configuration and Ports settings) that are also entered via the Console File, but only by those individuals possessing the system password.

(See System>System Setup>Security, page 4-6)

Consoles on File grid, scrolled to the right,
showing restricted access data

System>Consoles>Consoles on File grid>Consoles File screen

The Consoles File provides for the entry, maintenance and review of information regarding the monitoring console(s) configured to form a Life•line system.

The Consoles File screen

The top panel of the screen contains fields that identify and describe the Console currently being edited or reviewed.

FIELD	DESCRIPTION
Console ID	The unique identifier to be associated with a monitoring console. This is a free-form entry, four to ten alphanumeric characters long. The Console ID will be used as a primary reference code for the monitoring console on screens and reports throughout the Life•line system. For this reason, the Console ID should be both meaningful and memorable.
Description	A free-form entry used to further designate a monitoring console. The description will be used for reference and reporting purposes.

The bottom panel of the Consoles File screen consists of four tabbed pages:

* General Information
* Emergency Instructions

- Configuration
- Ports

System>Consoles>Consoles on File grid>Consoles File screen>General Information

General Information refers to the contact information associated with the monitoring console, as well the accessibility of system functions granted to Life•line attendants through that console.
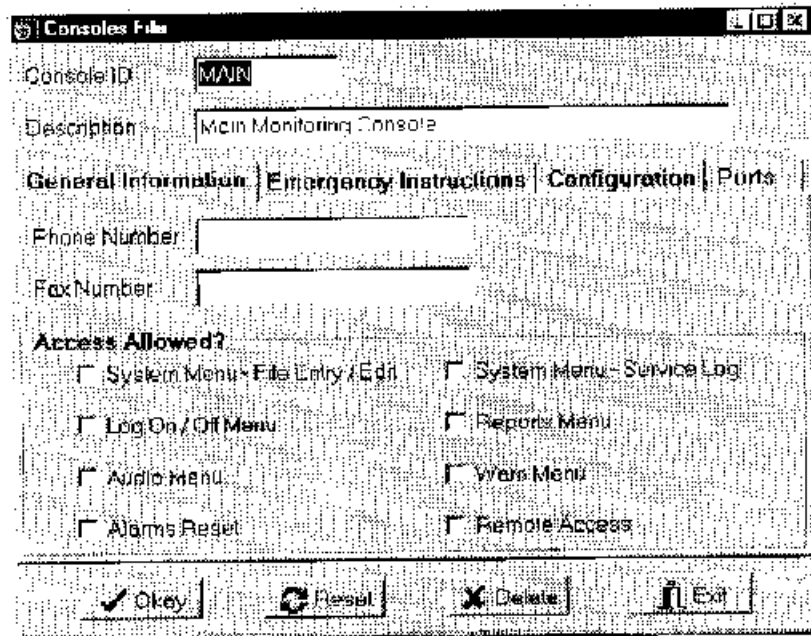
The Consoles File screen,
and the General Information tab page

FIELD	DESCRIPTION
Phone Number	A free-form entry used to identify the phone closest to the monitoring console.
Fax Number	A free-form entry used to identify the fax machine closest to the monitoring console.
Access Allowed? **System Menu** **File Entry/Edit**	A check mark placed in this box will enable all of the System Setup options from the System Menu, allowing access, edit, or review of system parameters from this console.
Access Allowed? **Log On/Off Menu**	A check mark placed in this box will enable the Log On/Off menu on the main screen, as well as any of its

FIELD	DESCRIPTION
	associated menu options, report screens, or speed buttons.
Access Allowed? **Audio Menu**	A check mark placed in this box will enable the Audio Menu on the main screen, as well as any of its associated menu options, report screens, or speed buttons
Access Allowed? **Alarms Reset**	A check mark placed in this box will enable the Alarms Reset privilege at this console.
Access Allowed? **System Menu - Service Log**	A check mark placed in this box will enable the Equipment Service Log selection on the System Menu.
Access Allowed? **Reports Menu**	A check mark placed in this box will enable the Reports menu on the main screen as well as any of its associated menu options, report screens, or speed buttons.
Access Allowed? **Warn Menu**	A check mark placed in this box will enable the Warn Menu on the main screen as well as any of its associated menu options, report screens, or speed buttons.
Access Allowed? **Remote Access**	A check mark placed in this box will enable this monitor's ability to assign its console duties to another console (networked systems only).

System>Consoles>Consoles on File grid>Consoles File screen>Emergency Instructions

Emergency Instructions are free-form comments intended to inform an attendant of special circumstances or guidelines associated with the monitoring console, particularly during alarm situations.
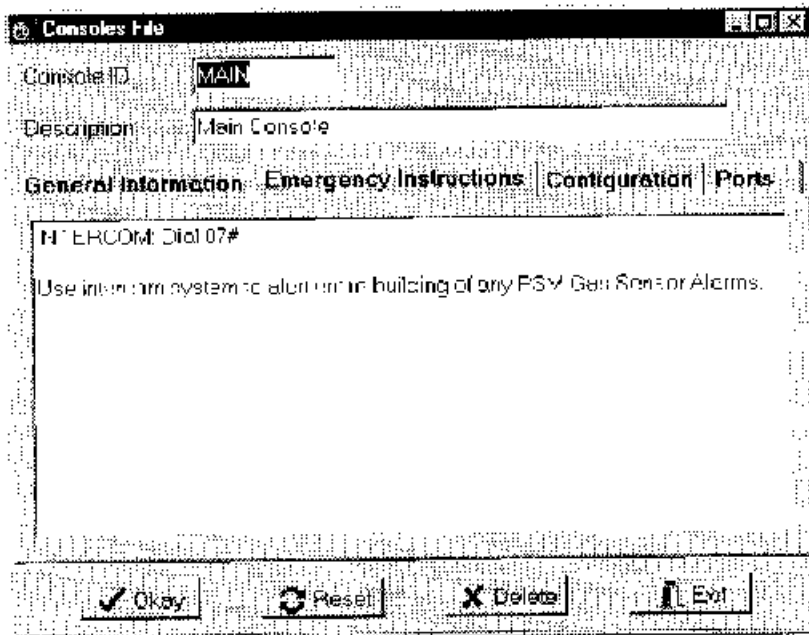
Emergency Information tab page

System>Consoles>Consoles on File grid>Consoles File screen> Configuration

Clicking the Configuration tab will bring forth a System Access password dialog box. The Configuration tab page cannot be accessed without the password (See System>System Setup>Security, page 4-6).

System Access password dialog box

Upon entering the correct password, the Configuration tab page will display.
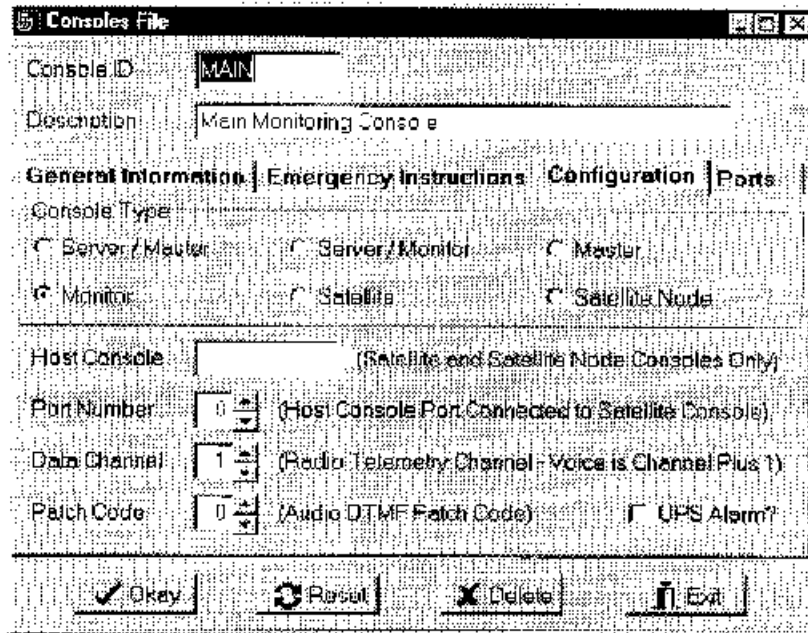
Configuration page of the Consoles File screen

CONSOLE TYPE	DESCRIPTION
Server/Master	Controls all connections within the network and coordinates all network messaging from and between monitor consoles. The server also has the ability to "watch" all activity on all monitor consoles.
Monitor	Executes PSM polling.
Server/Monitor	Controls all connections within the network and coordinates all network messaging, as well as executes PSM polling.
Satellite	Controlled by a master console. Activities or requests initiated here are transmitted to the Host Console.
Master	This option is not available at this time.
Satellite Node	This option is not available at this time.

FIELD	DESCRIPTION
Host Console	The unique identifier for the monitoring console coordinating the polling of this-and possibly other-monitoring consoles sharing the same frequency.
Port Number	The communications (Com) port in use by the satellite(s) connected to the Host.
Data Channel	A parameter that changes the Data/Voice channel in use by a PSM as it moves into a new area, as in Roaming operations (networked systems only).
Patch Code	A two-digit number that patches audio communications from one console to another during Remoting operations (networked systems only). Similar in concept to a PBX system, in which calls are routed from location to location.
UPS Alarm	If checked, indicates this monitoring console is equipped with an uninterruptible power supply (UPS), that will generate a Life•line alarm when the primary power fails.

## System>Consoles>Consoles on File grid>Consoles File screen>Ports

Clicking the Ports tab will bring forth a System Access password dialog box. The Ports page cannot be accessed without the password. (See System>System Setup>Security, page 4-6)

System Access password dialog box

Upon entering the correct password, the Ports screen will display.
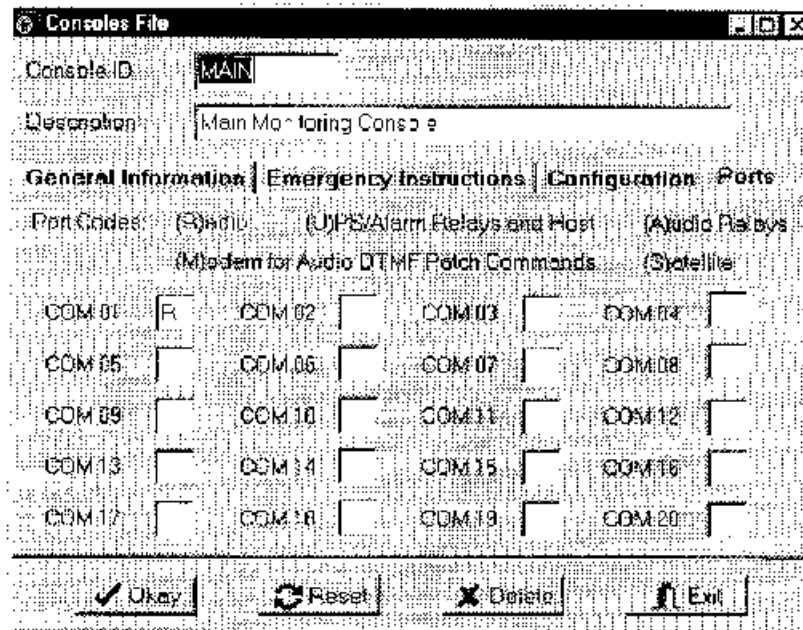
Ports tab page of the Consoles File screen

Consoles contain up to 20 (Com 01 through Com 20) RS-232 serial communication ports, available for use with a variety of hardware devices.

PORT CODES	DESCRIPTION
(R)adio	The radio device on a console that transmits/receives data to/from PSMs during polling.
(U)PS/Alarm Relays and Host	On a host, an input line for detecting alarms and strobe light commands from satellite consoles.
	On a satellite, an output line for sending alarm signals and strobe light commands to a Host.
(A)udio	A circuit that can be instructed by a console to open a speaker or radio on a PSM.
(M)odem for Audio/DTMF Patch Commands	A modem that generates Dual Tone Modulation Frequency from one console to another.
(S)atellite	Indicates that a Com port contains a satellite connection.

Configuring the Locations
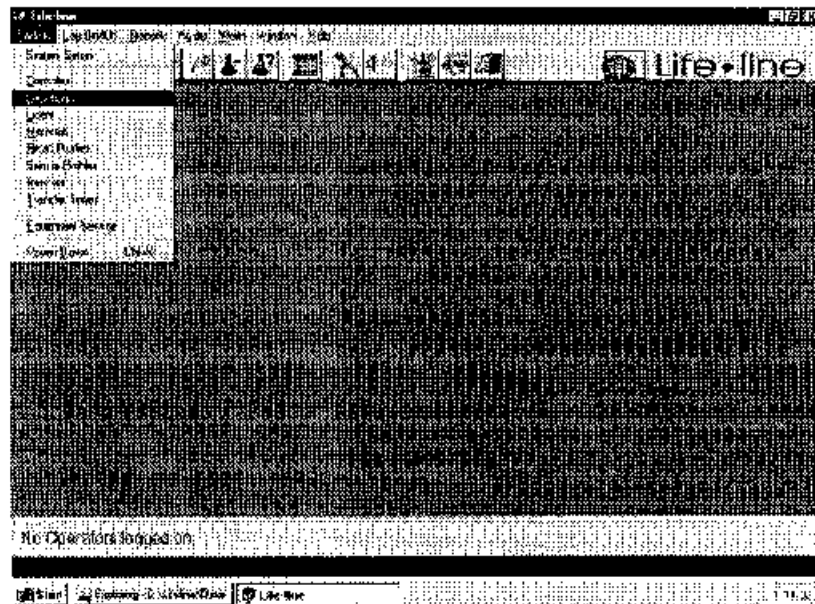
Navigating to the Locations Menu

The Locations menu selection allows the attendant to review, maintain, and, if authorized, enter and edit information concerning individual locations provided coverage by Life•line monitoring console(s).

Two screen levels compose the data entry/edit facility:

- Locations on File grid
- Locations File screen

Locations>Locations on File grid

The Locations on File grid is presented upon menu pull-down. Much of the Location(s) information presented here is summarized data that has been entered via the Locations File (see below).

The Locations are displayed in alphabetical order, based on Location Code (ID Code). The grid must be scrolled left or right to present all available data.

The Locations on File grid

Locations>Locations on File grid>Locations File screen

The Locations File provides for the entry, maintenance and review of information regarding the Location(s) under the control of the Life•line system.

Locations File screen/General Information tab page

The top panel of the screen contains fields that identify and describe the Location currently being edited or reviewed.

FIELD	DESCRIPTION
Location Code	A unique identifier associated with the location. This is a free-form entry, four to ten alphanumeric characters long.
	The Location Code will be used as a primary reference code for the Location on screens and reports throughout the Life•line system. For this reason, the Location Code should be both meaningful and memorable
Description	A free-form entry used to further designate the location. The description will be used for reference and reporting purposes.

The bottom panel of the Locations File screen consists of two tabbed pages:

- General Information
- Emergency Instructions

Locations>Locations on File grid>Locations File screen>General Information

General Information refers to the contact information associated with the Locations, the radio node(s) that location utilizes, as well restrictions and timing limits associated with the location.

FIELD	DESCRIPTION
Phone Number	A free-form entry used to identify the phone closest to the monitoring console.
Fax Number	A free-form entry used to identify the fax machine closest to the monitoring console.
Radio Node (Primary)	The console and radio com port to which this location connects and sends its telemetry data.
Radio Node (Alternate)	A secondary console and radio com port to which a PSM/PSM operator should be switched for polling once contact is lost at the primary Radio Node.
Area/Group	A free-form identifier that enables locations to be grouped by Area for the purpose of simultaneously contacting or warning operators in multiple locations. The Area/Group Code must be the same across locations to be grouped, but cannot be shared with locations governed by other monitoring consoles.
Training Level	A free-form number ranging from 1 to 99, corresponding to the level of training required of operators allowed to enter this location. Any operator attempting to log on or relocate to this location must possess a Trained Through Level greater than or equal to this value. Otherwise, the status bar will display the message, "Operator Untrained for this Location."
Access Code	An individual, two-character, alphanumeric code to be assigned to this location that limits access to only those operators whose Location Access Codes list possess those same codes. Any operator attempting to log on or transfer to this location must have the code in his User File. (See System>Users>Users on File grid>Users File screen, page 4-26)

| FIELD	DESCRIPTION
Restrictions: Hazardous Materials Allowed	Signifies whether materials identified as hazardous (via the Materials File) can be transported by an operator into this location. If not, hazardous materials will be suppressed from the list of materials eligible for transport into this location when logging an operator in to this location.
	Transfer to this location will be denied to operators currently carrying hazardous materials. (See Configuring the Materials, page 4-30)
Restrictions: Sensor Required	Signifies that only operators whose PSMs have an appropriate sensor attached will be allowed into this location. Any operator attempting to log on or relocate to this location must have a sensor.
Query Minutes	The number of minutes between "query" checks for PSM operators.
Alarm Minutes	Length of time, after a pre-alarm condition occurs, before the system will transmit an SOS alarm to PSM operators.
Lunch Minutes	The number of minutes PSM operators are allowed for meal breaks.
	During a Lunch break, the PSM is taken out of the poll cycle until the designated time period has ended.
	If this is a networked system, a PSM operator can put his PSM in Lunch mode during Roaming operations, and the time entered here is used to cover the period when the operator moves from the jurisdiction of one console to that of another.
Break Minutes	This Option is not available at this time.

Locations>Locations on File grid>Locations File screen>Emergency Instructions

Emergency Instructions are free-form comments intended to inform an attendant of special circumstances or guidelines associated with the Location, particularly during alarm situations.
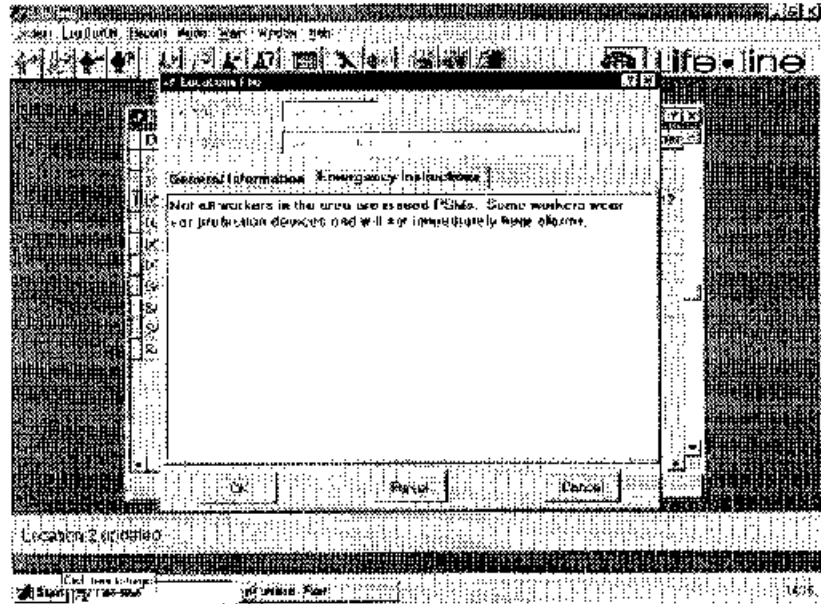
Emergency Information tab page of the Consoles File screen

Configuring the Users
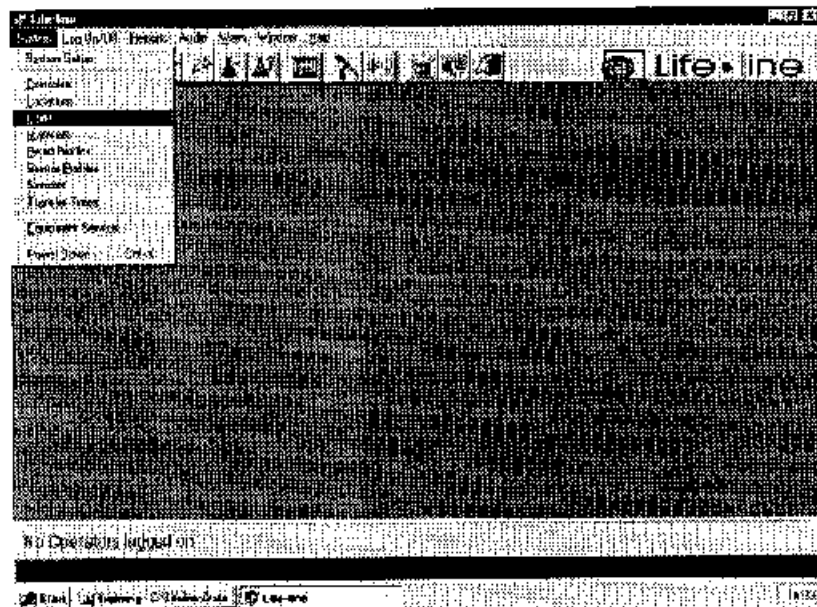
Navigating to the Users Menu

The Users file provides for the entry, maintenance and review of information on individual persons qualified and authorized to be Life•line monitoring console attendants, PSM operators, or supervisors.
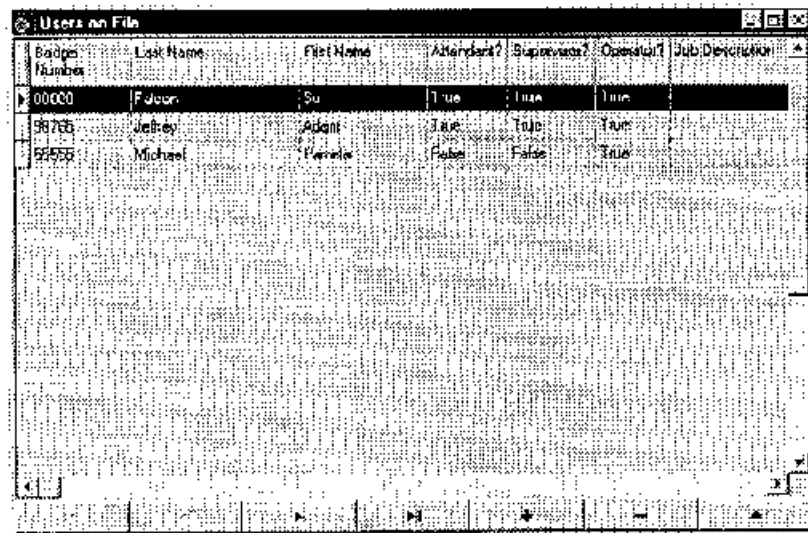
Two screen levels compose the entry/edit facility:

- Users on File grid
- Users File screen

System>Users>Users on File grid

The Users on File grid is presented upon menu pull-down. Much of the Users information presented here is summarized data that has been entered via the Users File (see below).

Entries are displayed in alphabetical order, based on the User's last name. The grid must be scrolled left or right to present all available data.

Badge Number	Last Name	First Name	Attendant?	Supervisor?	Operator?	Job Description
00000	F Jeon	Su	True	True	True	
98765	Jeffrey	Adam	True	True	True	
55555	Michael	Pamela	False	False	True	

Users on File grid

System>Users>Users on File grid>Users File screen

The Users File provides for the entry, maintenance and review of information regarding attendants, supervisors, and operators of the Life•line system.

General Information tab page of the Users On File screen

The top panel of the screen contains fields that identify and describe the User whose file is currently being edited or reviewed.

FIELD	DESCRIPTION
Badge Number	A unique identifier associated with the user, explicitly referring to the ID number printed on the employee's badge. This is a free-form entry, four to ten alphanumeric characters long.
	Any unique code can be assigned to users should actual badge numbers not be in use. The Badge Number will be the code used as a primary reference for the user on screens and reports throughout Life•line.
Last Name	A free-form entry of the user's last name.
	The user's full name (last name-first name format) is used for reference and reporting purposes.
First Name	A free-form entry of the user's first name (and initial, if desired).

The bottom panel of the Users File entry/edit screen consists of two tabbed pages:

- General Information
- Emergency Instructions

System>Users>Users on File grid>Users File screen>General Information

General Information reveals the identity and qualifications of the Life•line User.

FIELD	DESCRIPTION
Qualifications: Attendant	Signifies that the user is trained and authorized to log on to Life•line as the attendant for the monitoring console(s).
	Attendants are responsible for:
	- Issuing and collecting PSMs and attached sensors
	- Logging in, relocating and logging out operators
	- Coordinating voice communications requests
	- Issuing warnings
	- Resolving operator alarms
Qualifications: Supervisor	Signifies that the user is trained and authorized to reset Life•line alarms and to carry PSMs in supervisory operation mode.
	PSMs logged on for supervisory operation will register all alarms sent from their associated monitoring console. This allows the user to be immediately notified of alarm situations, regardless of his proximity to the actual monitoring console.
Qualifications: Operator	Signifies that the user is trained and authorized to carry the PSM.
Job Description	A free-form entry summarizing the specific duties and responsibilities of the user. This valuable information is referenced and displayed whenever alarms associated with this user occur, allowing emergency response teams to quickly pinpoint where a user is within their respective location.
Supervisor Name	The user's immediate supervisor.
Supervisor Phone	The phone number of the user's immediate supervisor.

FIELD	DESCRIPTION
Training Level	A number ranging from 1 to 99 corresponding to the level of training this operator has acquired for entry into specific locations. Any operator attempting to log on or relocate to a location must possess a Training Level greater than or equal to the Minimum Required Training Level of that location.
Access Codes	A free-form entry consisting of one or more two-character location Access Codes that allow the user to log on to any and all locations with those specified codes. Entry into any location for which the necessary code is not listed will be denied.
Certification Date	The date upon which the user is no longer certified to perform the duties he is trained for.
	Although not currently restricted by the system, the user should not be allowed to log on to Life•line until certification information has been updated.
Training Date	The last date on which the user received Safe Environment Engineering-approved training in the qualified use of the Life•line system, either as an attendant, supervisor or operator.
	Although not currently restricted by the system, the user should not be allowed to log on to Life•line if the training date is over a year old.

System>Users>Users on File grid>Users File screen>Emergency Instructions

Emergency Instructions are free-form comments intended to inform an attendant of special circumstances or guidelines associated with the user, particularly during alarm situations.

Emergency Instructions tab page of Users File

Configuring the Materials

NOTE: Unless the Materials box has been checked on the System Setup Configuration tab page, the Materials menu and any of its associated screens, reports, and speed buttons will be disabled. (See System>System Setup>Configuration, page 4-2)

Navigating to the Materials menu

The Materials file provides for the entry, maintenance and review of information on materials (hazardous or otherwise) transported into and out of locations by PSM operators.

Two levels compose the entry/edit facility:

- Materials on File grid
- Materials File screen

System>Materials>Materials on File grid

The Materials on File grid is presented upon menu pull-down. Much of the Materials information presented here is summarized data that has been entered via the Materials File (see below).

The Materials are displayed in alphabetical order, based on Material code (ID Code).

The Materials on File grid

System>Materials>Materials on File grid>Materials File screen

The Materials File provides for the entry, maintenance and review of information regarding materials to be tracked to and from locations monitored by the Life•line system.


The Materials File screen

Three fields compose the Materials File:

FIELD	DESCRIPTION
Material Code	A unique identifier associated with the type of materials being tracked. This free-form entry, two to ten alphanumeric characters long, should reflect the material being handled (e.g., "LIGHT" for portable halogen work light). The Material Code and Description (see below) is used for reference and reporting throughout the Life•line system.
Description	A free-form entry used to better identify materials being tracked.
Hazardous	If checked, signifies that the material being tracked represents a significant health hazard to the operators transporting it in and out of locations. Locations may be coded to disallow the transportation of hazardous materials into them. (See <u>Configuring the Locations</u>, page 4-20)

Configuring the Read Profiles
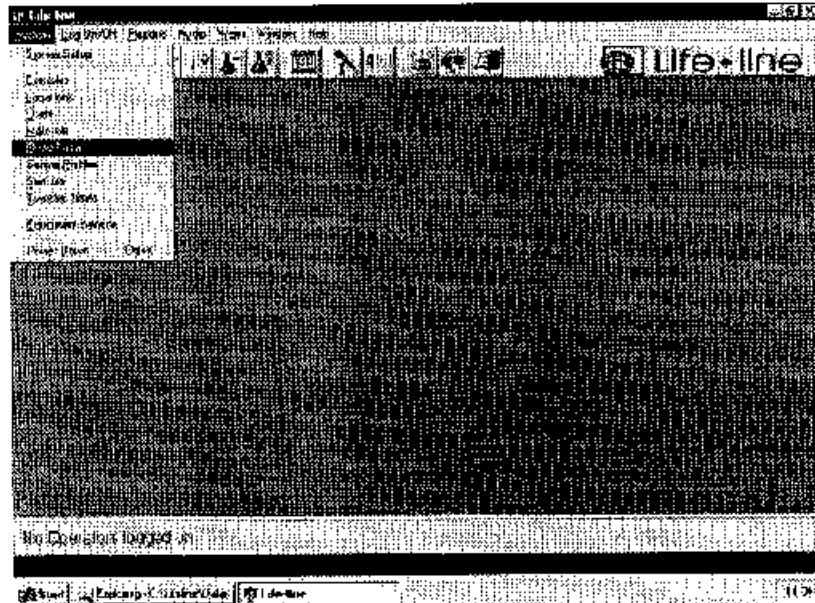
Navigating to the Read Profiles menu

The Read Profiles provides for the entry, maintenance and review of the information of configuration and read parameters common to various series of sensors. The Life•line system currently provides for all manner of digital sensors supporting up to 4 read profiles per sensor.

Two screen levels compose the entry/edit facility:

- Read Profiles on File grid
- Read Profiles file

System>Read Profiles>Read Profiles on File grid

The Read Profiles on File grid is presented upon menu pull-down. Much of the Read Profile(s) information presented here is summarized data that has been entered via a Read Profiles File (see below.)

Read Profiles are displayed in profile code order (ID Code). The grid must be scrolled left or right to present all available data.
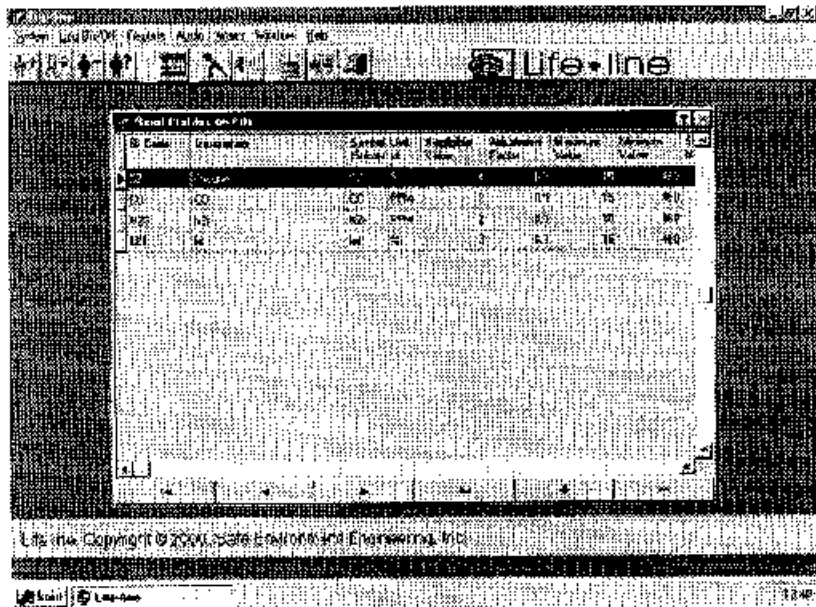
The Read Profiles on File grid

System>Read Profiles>Read Profiles File Screen

The Read Profiles File provides for the entry, maintenance and review of information regarding the Read Profiles configured for the user by Safe Environment Engineering, for use with the Life•line System.

The Read Profiles File screen

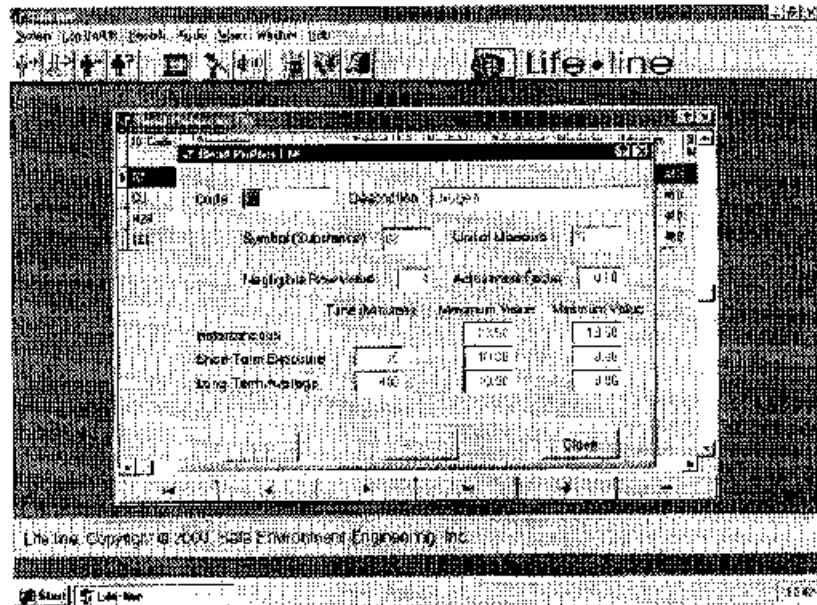| FIELD	DESCRIPTION
Code	A free-form entry used to further identify the read type.
Description	The unique identifier associated with the specific read type. This free-form entry, two to ten alphanumeric characters long, should reflect both the sensor profile and the nature of the individual read type. The Code and Description (see below) are used for reference and reporting throughout the Life•line system.
Symbol (Substance)	The scientific designation of the read value (e.g. "O2"), for reference and reporting purposes.
Unit of Measure	The description or coding quantifying the read value (e.g., %, degrees, ppm, etc.). The Sensor Unit Measure is used for reference and reporting purposes.
Negligible Raw Value	A number representing the raw read value at or below which the reading should be considered inconsequential and therefore ignored.
Adjustment Factor	The multiplier number that should be applied to the raw read value to determine the actual reportable reading. The raw read value is always an integer (i.e., no decimals), whereas the actual reading is often a fractional or percentage value. All limits and averages are calculated against the adjusted read value.

Instantaneous Maximum Value	The highest adjusted read value that can be recorded in any instant without triggering an alarm. Any value matching or exceeding the maximum is assumed unsafe and will immediately be reported.
Instantaneous Minimum Value	The lowest adjusted read value that can be recorded in any instant without triggering an alarm. Any value matching or dropping below the minimum is assumed unsafe and will immediately be reported. An entry of zero reflects no minimum value.
Short-Term Exposure	The number of seconds over which the short-term average exposure level will be calculated for this read type. OSHA's short-term period is 15 minutes, expressed as 900 seconds. An entry of zero signifies that short-term averages should not be calculated. NOTE: This field is only accessible on the first Read tab; a single Short-Term Exposure time value is applied to all four reads' average exposure calculations.
Short-Term Exposure Maximum Value	The highest short-term average exposure read value that can be calculated without triggering an alarm. Any average value exceeding the maximum is assumed unsafe and will be immediately reported.
Short-Term Exposure Minimum Value	The lowest short-term average read value that can be calculated without triggering an alarm. Any average value dropping below the minimum is assumed unsafe and will be immediately reported. An entry of zero reflects no average minimum value.

Long-Term Average Time	The number of seconds over which the long-term average exposure level will be calculated for this read type. OSHA's long-term period is 8 hours, expressed as 28800 seconds. An entry of zero signifies that long-term averages should not be calculated.
	NOTE: This field is only accessible on the first Read tab; a single Long-Term Average Time value is applied to all four reads' average exposure calculations.
Long-Term Average Maximum Value	The highest long-term average read value that can be calculated without triggering an alarm. Any average value exceeding the maximum is assumed unsafe and will be immediately reported.
Long-Term Average Minimum Value	The lowest long-term average read value that can be calculated without triggering an alarm. Any average value dropping below the minimum is assumed unsafe and will be immediately reported. An entry of zero reflects no average minimum value.

Configuring the Sensor Profiles
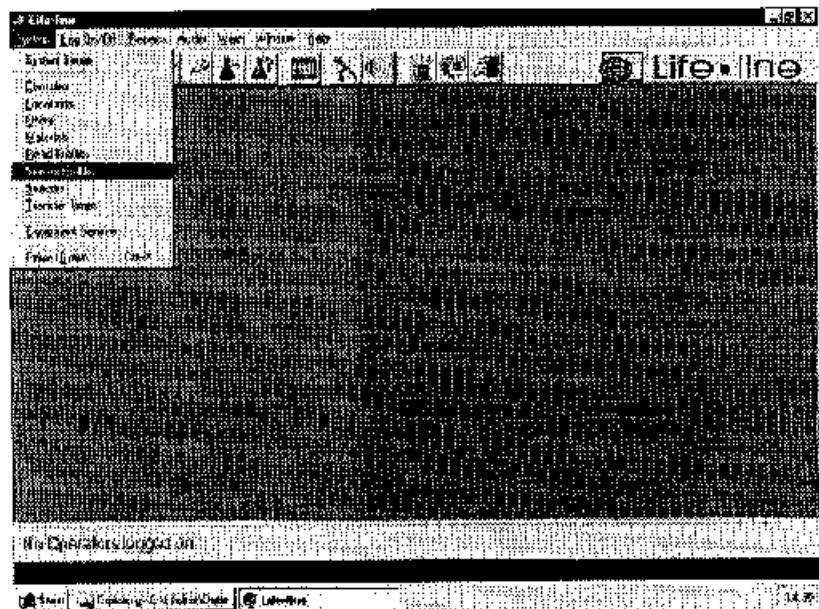
Navigating to the Sensor Profiles menu

The Sensor Profiles provides for the entry, maintenance and review of information of configuration and read parameters common to various series of sensors. The Life•line system currently provides for all manner of digital and analog sensors supporting up to 4 read types.

Two screen levels compose the entry/edit facility:

- Sensor Profiles on File grid
- Sensor Profiles File screen

System>Sensor Profiles>Sensor Profiles on File grid

The Sensor Profiles on File grid is presented upon menu pull-down. Much of the Sensor Profile(s) information presented here is summarized data that has been entered via the Sensor Profiles File (see below).
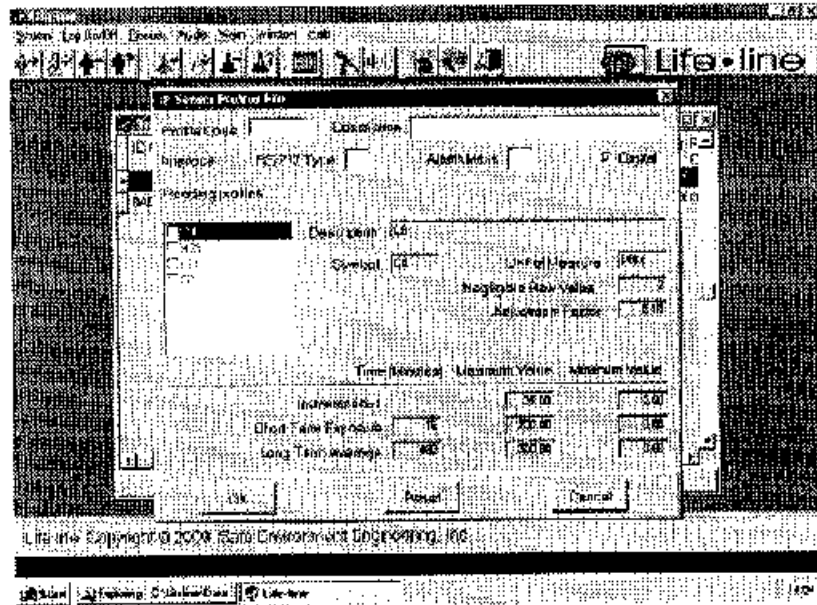
Sensor Profiles are displayed in profile code order (ID Code). The grid must be scrolled left or right to present all available data.

The Sensor Profiles on File grid

System>Sensor Profiles>Sensor Profiles on File grid>Sensor Profiles File screen

The Sensor Profiles File provides for the entry, maintenance and review of information regarding the Sensor Profiles configured for the user by Safe Environment Engineering, for use with the Life•line system.

The Sensor Profiles File screen

FIELD	DESCRIPTION
Profile Code	A unique identifier associated with the specific sensor profile. This free-form entry, two to ten alphanumeric characters long, should reflect the series and nature of the sensors defined. The Profile Code and Description (see below) are used for reference and reporting throughout the Life•line system.
Description	A free-form entry used to better identify the sensors.
Interface: RS-232 Type	The hexadecimal (base-16) value required for serial communications between the sensors and the PSM to which they are attached.
	Improperly coded sensors cannot be reliably polled through their attached PSMs; any attempts to log on will result in a Sensor Retry alarm or inaccurate readings. Safe Environment Engineering will supply the appropriate RS-232 Type Code for sensors certified for use within the Life•line system.
Interface: Alarm Mask	The hexadecimal (base-16) value required for the PSM to properly interpret and report alarms generated by the sensors. Improperly coded sensors may not reliably report all sensor-originated alarm conditions. Safe Environment Engineering will supply the appropriate Alarm Mask Code

FIELD	DESCRIPTION
	for sensors certified for use within the Life•line system.
Interface: Digital	If checked, the reading data reported to Life•line from the sensors (i.e., through the PSMs) are digital in nature and do not require any adjustment. This is the only option available at this time.
Reading Profiles	Displayed in the left of the screen in box form are the Reading Profiles setup in the Read Profiles (See System>System Setup>Read Profiles, page 4-34) Select up to four Reading Profiles by clicking on the appropriate box(s).

Configuring the Sensors File
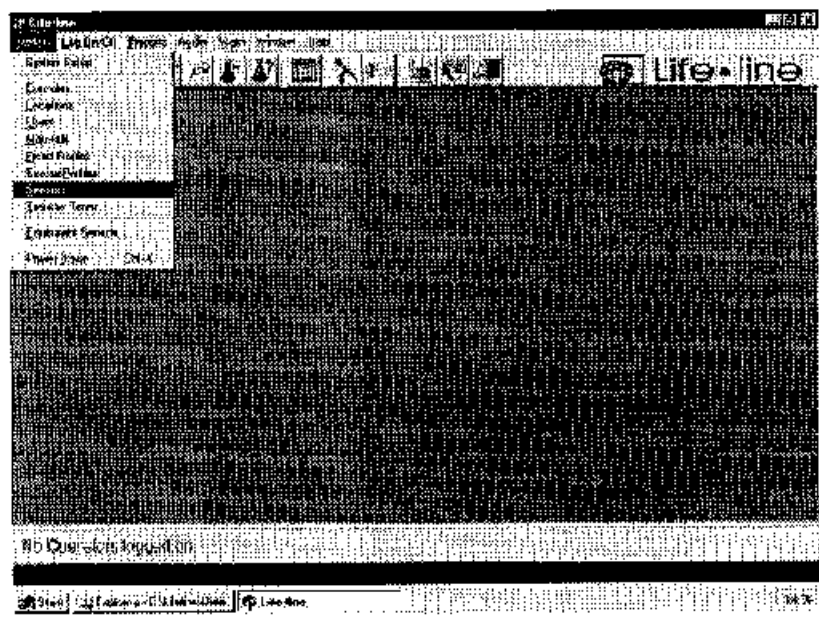
Navigating to the Sensors menu

The Sensors file provides for the entry, maintenance and review of information on individual sensors that are used with PSMs. All types of Safe Environment Engineering-approved devices may be used gas

detectors, heat stress monitors, etc. The Life•line system currently provides for up to 125 PSMs with attached sensors per console.

Note: The system will not automatically generate sensor records until sensor profile information has been entered into the system.
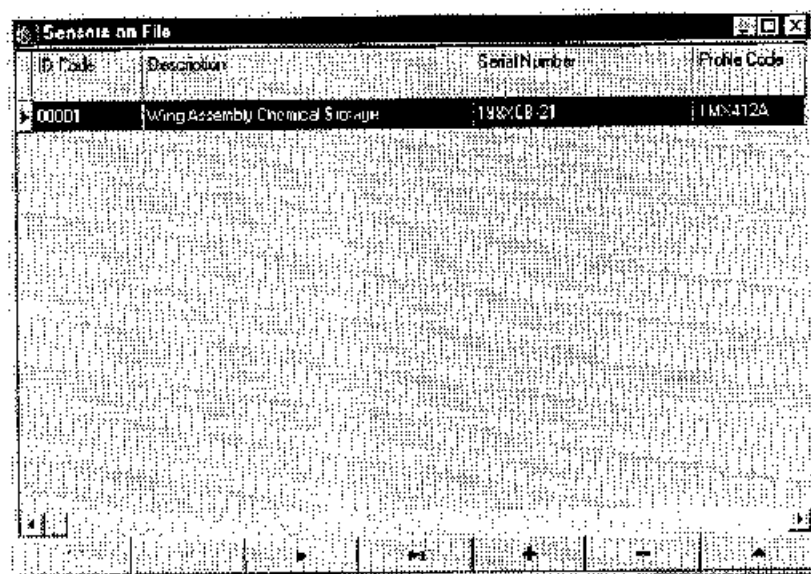
Two screen levels compose the entry/edit facility

- Sensors on File grid
- Sensors File screen

System>Sensors>Sensors on File grid

The Sensors on File grid is presented upon menu pull-down. Much of the sensors information presented here is summarized data that has been entered via the Sensors File (see below).

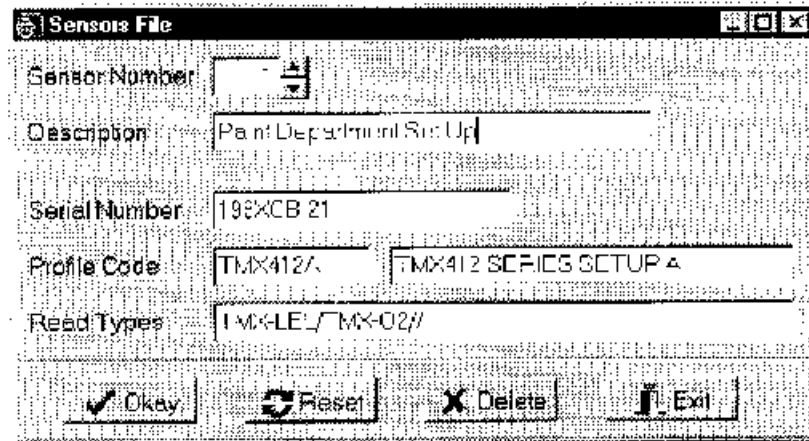The sensors are displayed in alphabetical order, based on Sensor Number (ID Code).

The Sensors on File grid

System>Sensors>Sensors on File grid>Sensors File screen

The Sensors File screen provides for the entry, maintenance, and review of information regarding the Sensor(s) configured for use with the Life•line system.

The Sensors File screen

This screen contains fields that identify and describe the Sensor currently being edited or reviewed.

FIELD	DESCRIPTION
Sensor Number	A number from 1 to 999 designated to uniquely differentiate the sensor. No two sensors can share the same number.
Description	A unique identifier associated with the sensor. This is a free-form entry. The sensor description will be used as a primary reference code for this Sensor on screens and reports throughout the Life•line system.
Serial Number	The unique code assigned by the manufacturer to this sensor, as printed on the sensor. The Serial Number, if entered, is displayed for verification purposes at operator log on, and is quite useful in service/maintenance related activities.
Profile Code/Description	The first field identifies the Profile Code set up in the Sensor Profiles File. The second field is the free-form alphanumeric description set up in the Sensor Profiles file that can be used to more fully describe the read values. Right click for available codes. (See System>Sensor Profiles>Sensor Profiles on File grid>Sensor Profiles File screen, page 4-39)
Read Types	The unique identifiers, separated by a "/", that are found on the four read tabs associated with each sensor.

This information is taken automatically from the Code field of each read tab, previously configured in the Sensor Profiles File by Safe Environment Engineering. (See |

FIELD   DESCRIPTION

System>Sensor Profiles>Sensor Profiles on File
grid>Sensor Profiles File screen, page 4-39)

Configuring Equipment Service Logs
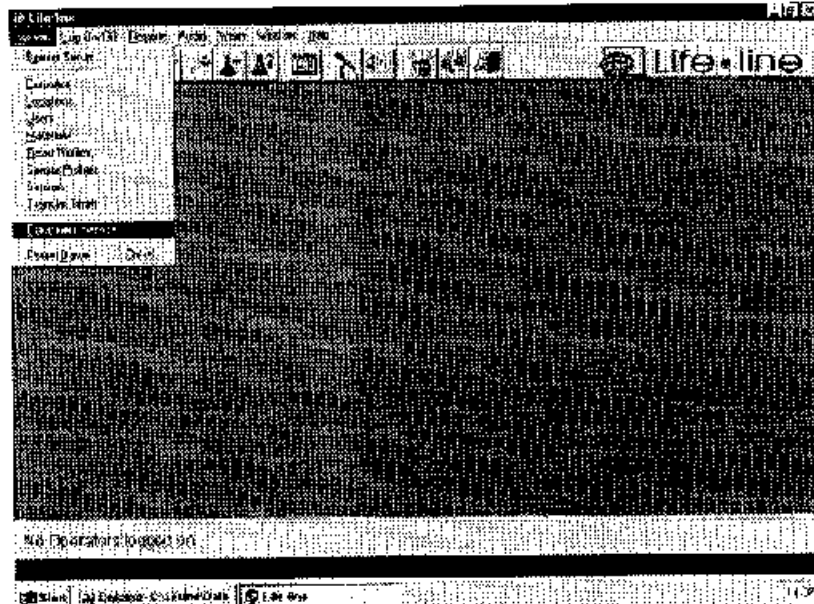
Navigating to the Equipment Service menu

The Equipment Service menu selection allows the attendant to review, maintain, and, if authorized, enter and edit information concerning Life•line equipment that has been taken out of or returned to service.

Two screen levels compose the data entry/edit facility:

- Service Records on File grid
- Service Records File screen

System>Equipment Service>Service Records on File grid

The Service Records on File grid is presented upon menu pull-down. Much of the information presented here is summarized data that has been entered via the Equipment Service File.

The Service Records are displayed in ascending numerical order, based on Date Out of Service. The grid must be scrolled left or right to present all available data.